



BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XF286

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Site Characterization Surveys off the Coast of New Jersey

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an Incidental Harassment Authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to Ocean Wind, LLC (Ocean Wind), to incidentally harass, by Level B harassment only, marine mammals during high-resolution geophysical (HRG) and geotechnical survey investigations associated with marine site characterization activities off the coast of New Jersey in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0498) (Lease Area).

DATES: This Authorization is effective from June 8, 2017, through June 7, 2018.

FOR FURTHER INFORMATION CONTACT: Laura McCue, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the applications and supporting documents, as well as a list of the references cited in this document, may be obtained online at: www.nmfs.noaa.gov/pr/permits/incidental/energy_other.htm. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined “negligible impact” as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

The MMPA states that the term “take” means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, the MMPA defines “harassment” as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action with respect to environmental consequences on the human environment.

Summary of Request

NMFS received a request from Ocean Wind for an IHA to take marine mammals incidental to 2017 geophysical survey investigations off the coast of New Jersey in the OCS-A 0498 Lease Area, designated and offered by the U.S. Bureau of Ocean Energy Management (BOEM), to support the development of an offshore wind project. Ocean Wind's request was for harassment only, and NMFS concurs that mortality is not expected to result from this activity; therefore, an IHA is appropriate.

The planned geophysical survey activities will occur for 42 days beginning in early June 2017, and geotechnical survey activities will take place in September 2017 and last for approximately 12 days. The following specific aspects of the planned activities are likely to result in the take of marine mammals: shallow and medium-penetration sub-bottom profilers (chirper and sparker) used during the HRG survey, and dynamically-positioned (DP) vessel thruster used in support of geotechnical survey activities. Take, by Level B Harassment only, of individuals of five species of marine mammals is anticipated to result from the specified activities. No serious injury or mortality is expected from Ocean Wind's HRG and geotechnical surveys.

Description of the Specified Activity

Overview

Ocean Wind plans to conduct a geophysical and geotechnical survey off the coast of New Jersey in the Lease Area to support the characterization of the existing seabed and subsurface geological conditions in the Lease Area. This information is necessary to support the siting, design, and deployment of up to two meteorological data collection buoys called floating light and detection ranging buoys (FLIDARs) and up to two metocean and current buoys, as well as to obtain a baseline assessment of seabed/sub-surface soil conditions in the Lease Area to support the siting of the wind farm. Surveys will include the use of the following equipment: multi-beam depth sounder, side-scan sonar, sub-bottom profiler, and cone penetration tests (CPTs). A detailed description of the planned marine site characterization project was provided in the **Federal Register** notice for the proposed IHA (82 FR 20563; May 3, 2017). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Dates and Duration

HRG surveys are anticipated to commence in early June 2017 and will last for approximately 42 days, including estimated weather down time. Geotechnical surveys requiring the use of the DP drill ship will take place in September 2017, at the earliest, and will last for approximately 12 days excluding weather downtime. Equipment is expected run continuously for 24 hours per day.

Specified Geographic Region

Ocean Wind's survey activities will occur in the approximately 160,480-acre Lease Area designated and offered by the BOEM, located approximately nine miles (mi) southeast of Atlantic City, New Jersey, at its closest point (see Figure 1 of the IHA application). The Lease

Area falls within the New Jersey Wind Energy Area (NJ WEA; Figure 1-1 of the IHA application) with water depths ranging from 15-40 meters (m) (49-131 feet (ft)).

Detailed Description of Specific Activities

HRG Survey Activities

Marine site characterization surveys will include the following HRG survey activities:

- Depth sounding (multibeam depth sounder) to determine water depths and general bottom topography;
- Magnetic intensity measurements for detecting local variations in regional magnetic field from geological strata and potential ferrous objects on and below the bottom;
- Seafloor imaging (sidescan sonar survey) for seabed sediment classification purposes, to identify natural and man-made acoustic targets resting on the bottom as well as any anomalous features;
- Shallow penetration sub-bottom profiler (chirper) to map the near surface stratigraphy (top 0-5 meter (m) soils below seabed); and
- Medium penetration sub-bottom profiler (sparker) to map deeper subsurface stratigraphy as needed (soils down to 75-100 m below seabed).

Table 1 identifies the representative survey equipment that is being considered in support of the HRG survey activities. The make and model of the listed HRG equipment will vary depending on availability but will be finalized as part of the survey preparations and contract negotiations with the survey contractor. The final selection of the survey equipment will be confirmed prior to the start of the HRG survey program. Only the make and model of the HRG equipment may change, not the types of equipment or the addition of equipment with characteristics that might have effects beyond (*i.e.*, resulting in larger ensonified areas) those

considered in this proposed IHA. None of the proposed HRG survey activities will result in the disturbance of bottom habitat in the Lease Area.

Table 1. Summary of Proposed HRG Survey Equipment

HRG Equipment	Operating Frequencies	Source Level (Manufacturer) (dB_{peak}; dB_{rms})	Source Level (Bay State Wind Survey)* (dB_{peak}; dB_{rms})	Beamwidth (degree)	Pulse Duration (millisec)
Sonardyne Ranger 2 USBL	35-50kHz	200 dB _{Peak} ; n/a	194 dB _{Peak} 166.10 dB _{rms}	180	1
Klein 3000H Sidescan Sonar	445/900 kHz	245 dB _{Peak} ; 242 dB _{rms}	n/a; n/a	0.2	0.0025 to 0.4
GeoPulse Sub-bottom Profiler (chirper)	1.5 to 18 kHz	223.5 dB _{Peak} ; 208 dB _{rms}	203 dB _{Peak} 172.45 dB _{rms}	55	0.1 to 22
Geo-Source 600/800 (sparker)	50 to 5000 Hz	222/223 dB _{Peak} ; 221/223 dB _{rms}	206/212 dB _{Peak} 182.10/188.15 dB _{rms}	110	1 to 10
SeaBat 7125 Multibeam Sonar	200/400 kHz	220 dB _{Peak} ; 213 dB _{rms}	n/a; n/a	2	0.03 to 0.3

*Gardline 2016, 2017

The HRG survey activities will be supported by a vessel approximately 98 to 180 feet (ft) in length and capable of maintaining course and a survey speed of approximately 4.5 knots while transiting survey lines. HRG survey activities across the Lease Area will generally be conducted at 900-meter (m) line spacing. Up to two FLIDARs and two wave buoys will be deployed within the Lease Area, and up to three potential locations for FLIDAR deployment will be investigated. At each FLIDAR and wave buoy deployment locations, the survey will be conducted along a tighter 30-m line spacing to meet the BOEM requirements as set out in the July 2015 Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant and Archeological and Historic Property Information in 30 CFR part 585.

The equipment positioning systems use vessel-based underwater acoustic positioning to track equipment (in this case, the sub-bottom profiler) in very shallow to very deep water. Equipment positioning systems will be operational at all times during HRG survey data acquisition (*i.e.*, concurrent with the sub-bottom profiler operation). Sub-bottom profiling systems identify and measure various marine sediment layers that exist below the sediment/water interface. A sound source emits an acoustic signal vertically downwards into the water and a receiver monitors the return signal that has been reflected off the sea floor. Some of the acoustic signal will penetrate the seabed and be reflected when it encounters a boundary between two layers that have different acoustic impedance. The system uses this reflected energy to provide information on sediment layers beneath the sediment-water interface. A shallow penetration sub-bottom profiler will be used to map the near surface stratigraphy of the Lease Area. A Geo-Source 200/800, or similar model, medium-penetration sub-bottom profiler (sparker) will be used to map deeper subsurface stratigraphy in the Lease Area as needed (soils down to 75-100 m below seabed). The sparker is towed from a boom arm off the side of the survey vessel and emits a downward pulse with a duration of 1 to 10 millisecond (ms) at an operating frequency of 50 to 5000 Hertz (Hz).

Geotechnical Survey Activities

Marine site characterization surveys will involve the following geotechnical survey activities:

- Sample boreholes to determine geological and geotechnical characteristics of sediments;
- Deep CPTs to determine stratigraphy and in-situ conditions of the deep surface sediments; and
- Shallow CPTs to determine stratigraphy and in-situ conditions of the near surface sediments.

It is anticipated that the geotechnical surveys will take place no sooner than September 2017. The geotechnical survey program will consist of up to 8 deep sample bore holes and adjacent 8 deep CPTs both to a depth of approximately 130 ft to 200 ft (40 m to 60 m) below the seabed, as well as 30 shallow CPTs, up to 130 ft (40 m) below seabed.

The investigation activities are anticipated to be conducted from a 250-ft to 350-ft (76 m to 107 m) DP drill ship. DP vessel thruster systems maintain their precise coordinates in waters with automatic controls. These control systems use variable levels of power to counter forces from current and wind. Operations will take place over a 24-hour period to ensure cost, the duration of survey activities, and the period of potential impact on marine species are minimized. Based on 24-hour operations, the estimated duration of the geotechnical survey activities will be approximately 12 days excluding weather downtime. Estimated weather downtime is approximately 10 days.

Please see the previously referenced **Federal Register** notice (82 FR 20563; May 3, 2017) for a more detailed description of the specified activity.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to Ocean Wind was published in the **Federal Register** on May 3, 2017 (82 FR 20563). That notice described, in detail, Ocean Wind's activity, the marine mammal species that may be affected by the activity and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received comments from the Marine Mammal Commission (Commission) and the Center for Regulatory Effectiveness (CRE).

Comment 1: The Commission recommends that, until the behavior thresholds are updated, NMFS require applicants to use the 120- rather than 160-dB re 1 μ Pa threshold for

acoustic, non-impulsive sources (e.g., chirp-type sub-bottom profilers, echosounders, and other sonars including side-scan and fish-finding).

Response: NMFS considers sub-bottom profilers to be impulsive sources; therefore, 160 dB threshold will continue to be used. Additionally, BOEM listed sparkers as impulsive sources (BOEM 2016). The 120-dB threshold is typically associated with continuous sources.

Continuous sounds are those whose sound pressure level remains above that of the ambient sound, with negligibly small fluctuations in level (NIOSH, 1998; ANSI, 2005). Intermittent sounds are defined as sounds with interrupted levels of low or no sound (NIOSH, 1998). Sub-bottom profiler signals are intermittent sounds. Intermittent sounds can further be defined as either impulsive or non-impulsive. Impulsive sounds have been defined as sounds which are typically transient, brief (<1 sec), broadband, and consist of a high peak pressure with rapid rise time and rapid decay (ANSI, 1986; NIOSH, 1998). Non-impulsive sounds typically have more gradual rise times and longer decays (ANSI, 1995; NIOSH, 1998). Sub-bottom profiler signals have durations that are typically very brief (<1 sec), with temporal characteristics that more closely resemble those of impulsive sounds than non-impulsive sounds. With regard to behavioral thresholds, we consider the temporal and spectral characteristics of sub-bottom profiler signals to more closely resemble those of an impulse sound rather than a continuous sound. The 160-dB threshold is typically associated with impulsive sources. Therefore, the 160-dB threshold (typically associated with impulsive sources) is more appropriate than the 120-dB threshold (typically associated with continuous sources) for estimating takes by behavioral harassment incidental to use of such sources.

Comment 2: The Commission recommends that NMFS work with the BOEM Office of Renewable Energy to determine the circumstances under which adoption of mutually agreed-

upon mitigation measures would avoid the potential for taking marine mammals and the need for an IHA. The Commission further recommends that NMFS use a consistent approach for reducing (or not reducing) the numbers of estimated takes based on the requirement to implement mitigation measures to preclude taking in the respective Level B harassment zones.

Response: NMFS appreciates the Commission's recommendations to streamline our incidental take authorization (ITA) process. NMFS believes that for this project with activities occurring at night and over a long duration, we are not comfortable assuming we can avoid all takes with mitigation measures in place. Ocean Wind's application included conservative monitoring measures, which will help reduce take of marine mammals, but may not completely eliminate the possibility for take.

In regards to the Commission's recommendation for using a consistent approach to reducing the number of estimated take, they referenced our ITAs involving Cook Inlet beluga whales. First, Ocean Wind's project is not the same situation as in Cook Inlet. In Cook Inlet there is a small resident population of beluga whales, and applicants have proposed shutting down when a certain number of total belugas observed within the Level B zone is reached to help ensure that no more than small numbers (an MMPA requirement) of belugas are taken during their activity. Second, regarding consistency, NMFS generally applies standard minimum mitigation requirements to different activity types. However, if an applicant proposes measures that are more protective than the standard minimum in their application (and NMFS believes that those measures will effect a reduction of impacts beyond the standard minimum measures), it suggests that those measures are practicable for the applicant may be appropriate for NMFS to include them to meet our least practicable adverse impact standard. Though standard minimum measures are helpful and generally used, the overall suite of mitigation measures is determined

on a case-by-case basis, is dependent upon multiple factors specific to the activity, environment, and affected species, and may vary some between projects.

Comment 3: CRE does not oppose NMFS' issuance of the IHA, but they do oppose NMFS' use of the acoustic Guidance in the IHA. Given the Executive Order (EO) 13795, CRE commented that NMFS does not have the authority to use the Guidance until the Commerce Secretary has completed his review and made a decision as to whether to revise or rescind the Guidance. They further recommend that NMFS remove any claim that OMB had approved an Information Collection Request (ICR) for the Guidance, and NMFS should correct information disseminations that suggest or require that the Guidance may be used for any regulatory purpose.

Response: As described in our May 31, 2017 **Federal Register** notice (82 FR 24950), NMFS is soliciting public comment on the Guidance in accordance with EO 13795. NMFS will also consult the appropriate Federal agencies to assist the Secretary of Commerce in reviewing the Technical Guidance for consistency with the policy in section 2 of EO 13795. As mandated by the EO, at the conclusion of the review the Secretary of Commerce will make a determination of how to proceed. At that point, NMFS will determine what information will be provided on our information disseminations. EO 13795 does not state that the Guidance cannot be used during the review process; therefore, the Guidance remains applicable during this time. The Guidance explicitly states that ITA applicants are not required to use it and that, if an alternative approach is likely to produce a more accurate estimate of auditory impact for the project being evaluated, the applicant may propose such an alternate approach (NMFS 2016). NMFS is currently in compliance under the Paperwork Reduction Act (PRA) for the ICR.

Description of Marine Mammals in the Area of the Specified Activity

There are 35 species of marine mammals that potentially occur in the Northwest Atlantic OCS region (BOEM 2014) (Table 2). The majority of these species are pelagic and/or northern species, or are so rarely sighted that their presence in the Lease Area is unlikely. Five species are considered to have the potential to co-occur with the planned survey activities: fin whale (*Balaenoptera physalus*), bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), harbor porpoise (*Phocoena phocoena*), and harbor seal (*Phoca vitulina*) (Right Whale Consortium 2016). Table 2 lists all species with expected potential for occurrence in the NE Atlantic OCS and summarizes information related to the population or stock. For status of species, we provide information regarding U.S. regulatory status under the MMPA and ESA. All managed stocks in this region are assessed in NMFS's U.S. 2016 Atlantic SARs and can be found here: <http://www.nmfs.noaa.gov/pr/species/>. All values presented in Table 2 are the most recent available at the time of publication and are available in the draft 2016 SARs. A detailed description of the of the species likely to be affected by the marine site characterization project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (82 FR 20563; May 3, 2017). Since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (www.nmfs.noaa.gov/pr/species/mammals/) for generalized species accounts.

Table 2. Marine mammals known to occur in the waters off the Northwest Atlantic OCS

Common Name	Stock	NMFS MMPA and ESA Status; Strategic (Y/N) ¹	Stock Abundance (CV,Nmin, most recent abundance	PBR ³	Occurrence and seasonality in the NW Atlantic OCS
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			survey) ²		
Toothed whale (Odontoceti)					
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	W. North Atlantic	--; N	48,819 (0.61; 30,403; n/a)	304	rare
Atlantic spotted dolphin (<i>Stenella frontalis</i>)	W. North Atlantic	--; N	44,715 (0.43; 31,610; n/a)	316	rare
Bottlenose dolphin (<i>Tursiops truncatus</i>)	W. North Atlantic, Offshore	--; N	77,532 (0.40; 56,053; 2011)	561	Common year round
Clymene Dolphin (<i>Stenella clymene</i>)	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Pantropical Spotted Dolphin (<i>Stenella attenuata</i>)	W. North Atlantic	--; N	3,333 (0.91; 1,733; n/a)	17	rare
Risso's dolphin (<i>Grampus griseus</i>)	W. North Atlantic	--; N	18,250 (0.46; 12,619; n/a)	126	rare
Short-beaked common dolphin (<i>Delphinus delphis</i>)	W. North Atlantic	--; N	70,184 (0.28; 55,690; 2011)	557	Common year round
Striped dolphin (<i>Stenella coeruleoalba</i>)	W. North Atlantic	--; N	54,807 (0.3; 42,804; n/a)	428	rare
Spinner Dolphin (<i>Stenella longirostris</i>)	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
White-beaked dolphin (<i>Lagenorhynchus albirostris</i>)	W. North Atlantic	--; N	2,003 (0.94; 1,023; n/a)	10	rare
Harbor porpoise (<i>Phocoena phocoena</i>)	Gulf of Maine/Bay of Fundy	--; N	79,833 (0.32; 61,415; 2011)	706	Common year round
Killer whale (<i>Orcinus orca</i>)	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
False killer whale (<i>Pseudorca crassidens</i>)	W. North Atlantic	--; Y	442 (1.06; 212; n/a)	2.1	rare
Long-finned pilot whale (<i>Globicephala melas</i>)	W. North Atlantic	--; Y	5,636 (0.63; 3,464; n/a)	35	rare
Short-finned pilot whale (<i>Globicephala macrorhynchus</i>)	W. North Atlantic	--; Y	21,515 (0.37; 15,913; n/a)	159	rare
Sperm whale (<i>Physeter macrocephalus</i>)	North Atlantic	E; Y	2,288 (0.28; 1,815; n/a)	3.6	Year round in continental shelf and slope waters, occur seasonally to forage
Pygmy sperm whale (<i>Kogia breviceps</i>)	W. North Atlantic	--; N	3,785 ^{b/} (0.47; 2,598; n/a)	26	rare
Dwarf sperm whale (<i>Kogia sima</i>)	W. North Atlantic	--; N	3,785 ^{b/} (0.47; 2,598; n/a)	26	rare
Cuvier's beaked whale (<i>Ziphius cavirostris</i>)	W. North Atlantic	--; N	6,532 (0.32; 5,021; n/a)	50	rare
Blainville's beaked whale (<i>Mesoplodon densirostris</i>)	W. North Atlantic	--; N	7,092 ^{c/} (0.54; 4,632; n/a)	46	rare
Gervais' beaked whale (<i>Mesoplodon europaeus</i>)	W. North Atlantic	--; N	7,092 ^{c/} (0.54; 4,632; n/a)	46	rare
True's beaked whale (<i>Mesoplodon mirus</i>)	W. North Atlantic	--; N	7,092 ^{c/} (0.54; 4,632; n/a)	46	rare
Sowerby's Beaked Whale (<i>Mesoplodon bidens</i>)	W. North Atlantic	--; N	7,092 ^{c/} (0.54; 4,632; n/a)	46	rare
Melon-headed whale (<i>Peponocephala electra</i>)	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Baleen whales (Mysticeti)					

Minke whale (<i>Balaenoptera acutorostrata</i>)	Canadian East Coast	--; N	2,591 (0.81; 1,425; n/a)	162	Year round in continental shelf and slope waters, occur seasonally to forage
Blue whale (<i>Balaenoptera musculus</i>)	W. North Atlantic	E; Y	Unknown (unk; 440; n/a)	0.9	Year round in continental shelf and slope waters, occur seasonally to forage
Fin whale (<i>Balaenoptera physalus</i>)	W. North Atlantic	E; Y	1,618 (0.33; 1,234; n/a)	2.5	Year round in continental shelf and slope waters, occur seasonally to forage
Humpback whale (<i>Megaptera novaeangliae</i>)	Gulf of Maine	--; N	823 (0; 823; n/a)	2.7	Common year round
North Atlantic right whale (<i>Eubalaena glacialis</i>)	W. North Atlantic	E; Y	440 (0; 440; n/a)	1	Year round in continental shelf and slope waters, occur seasonally to forage.
Sei whale (<i>Balaenoptera borealis</i>)	Nova Scotia	E; Y	357 (0.52; 236; n/a)	0.5	Year round in continental shelf and slope waters, occur seasonally to forage
Earless seals (Phocidae)					
Gray seals (<i>Halichoerus grypus</i>)	North Atlantic	--; N	505,000 (unk; unk; n/a)	Undet	Unlikely
Harbor seals (<i>Phoca vitulina</i>)	W. North Atlantic	--; N	75,834 (0.15; 66,884; 2012)	2,006	Common year round
Hooded seals (<i>Cystophora cristata</i>)	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Harp seal (<i>Phoca groenlandica</i>)	North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare

¹ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

²CV is coefficient of variation; N_{\min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks, abundance estimates are actual counts of animals and there is no associated CV. The most recent abundance survey that is reflected in the abundance estimate is presented; there may be more recent surveys that have not yet been incorporated into the estimate. All values presented here are from the draft 2016 Pacific SARs.

³Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

Potential Effects of the Specified Activity on Marine Mammals and Their Habitat

The effects of underwater noise from HRG and geotechnical activities for the marine site characterization project have the potential to result in behavioral harassment of marine mammals in the vicinity of the action area. The Federal Register notice for the proposed IHA (82 FR 20563; May 3, 2017) included a discussion of the effects of anthropogenic noise on marine

mammals, therefore that information is not repeated here. Please refer to the **Federal Register** notice (82 FR 20563; May 3, 2017) for that information.

Estimated Take

This section provides an estimate of the number of incidental takes authorized in this IHA, which informed both NMFS' consideration of whether the number of takes is "small" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes will be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to HRG and geotechnical surveys. Based on the nature of the activity, the short duration of activities, and the small Level A isopleths (less than 3 m for all sources), Level A harassment is neither anticipated nor authorized. The death of a marine mammal is also a type of incidental take. However, as described previously, no mortality is anticipated or authorized for this activity. Below we describe how the take is estimated for this project.

Project activities that have the potential to harass marine mammals, as defined by the MMPA, include underwater noise from operation of the HRG survey sub-bottom profilers and noise propagation associated with the use of DP thrusters during geotechnical survey activities

that require the use of a DP drill ship. NMFS anticipates that impacts to marine mammals will be in the form of behavioral harassment, and no take by injury, serious injury, or mortality is authorized.

The basis for the take estimate is the number of marine mammals that will be exposed to sound levels in excess of NMFS' Level B harassment criteria for impulsive noise (160 dB re 1 μ Pa (rms) and continuous noise (120 dB re 1 μ Pa (rms)), which is generally determined by overlaying the area ensonified above NMFS acoustic thresholds for harassment within a day with the density of marine mammals, and multiplying by the number of days. NMFS' current acoustic thresholds for estimating take are shown in Table 3 below.

Table 3. NMFS's Acoustic Exposure Criteria.

Criterion	Definition	Threshold
Level B harassment (underwater)	Behavioral disruption	160 dB (impulsive source) / 120 dB (continuous source) (rms)
Level B harassment (airborne)	Behavioral disruption	90 dB (harbor seals) / 100 dB (other pinnipeds) (unweighted)

Modeling took into consideration sound sources using the potential operational parameters, bathymetry, geoacoustic properties of the Lease Area, time of year, and marine mammal hearing ranges. Results from the hydroacoustic modeling and measurements showed that estimated maximum distance to the 160 dB re 1 μ Pa (rms) MMPA threshold for all water depths for the HRG survey sub-bottom profilers (the HRG survey equipment with the greatest potential for effect on marine mammal) was approximately 75.28 m from the source using practical spreading (Subacoustech 2016), and the estimated maximum critical distance to the 120 dB re 1 μ Pa (rms) MMPA threshold for all water depths for the drill ship DP thruster was

approximately 500 m from the source (Subacoustech 2016). Ocean Wind and NMFS believe that these estimates represent the a conservative scenario and that the actual distances to the Level B harassment threshold may be shorter for HRG equipment, as practical spreading ($15\log R$) was used to estimate the ensonified area here and there are some sound measurements taken in the Northeast that suggest a higher spreading coefficient (which would result in a shorter distance) may be applicable.

Ocean Wind estimated species densities within the project area in order to estimate the number of marine mammal exposures to sound levels above the 120 dB Level B harassment threshold for continuous noise (*i.e.*, DP thrusters) and the 160 dB Level B harassment threshold for intermittent, impulsive noise (*i.e.*, sub-bottom profiler). Research indicates that marine mammals generally have extremely fine auditory temporal resolution and can detect each signal separately (*e.g.*, Au *et al.*, 1988; Dolphin *et al.*, 1995; Supin and Popov 1995; Mooney *et al.*, 2009b), especially for species with echolocation capabilities. Therefore, it is likely that marine mammals will perceive the acoustic signals associated with the HRG survey equipment as being intermittent rather than continuous, and we base our takes from these sources on exposures to the 160 dB threshold.

The data used as the basis for estimating cetacean density (“D”) for the Lease Area are sightings per unit effort (SPUE) derived by Duke University (Roberts *et al.*, 2016). For pinnipeds, the only available comprehensive data for seal abundance is the Northeast Navy Operations Area (OPAREA) Density Estimates (DoN 2007). SPUE (or, the relative abundance of species) is derived by using a measure of survey effort and number of individual cetaceans sighted. SPUE allows for comparison between discrete units of time (*i.e.* seasons) and space within a project area (Shoop and Kenney 1992). The Duke University (Roberts *et al.*, 2016)

cetacean density data represent models derived from aggregating line-transect surveys conducted over 23 years by 5 institutions (NMFS Northeast Fisheries Science Center (NEFSC), New Jersey Department of Environmental Protection (NJDEP), NMFS Southeast Fisheries Science Center (SEFSC), University of North Carolina Wilmington (UNCW), Virginia Aquarium & Marine Science Center (VAMSC)), the results of which are freely available online at the Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP) repository. Monthly density values were within the survey area were averaged by season to provide seasonal density estimates. The OPAREA Density Estimates (DoN 2007) used for pinniped densities were based on data collected through NMFS NWFSC aerial surveys conducted between 1998 and 2005.

The Zone of influence (ZOI) is the extent of the ensonified zone in a given day. The ZOI was calculated using the following equations:

- Stationary source (*e.g.* DP thruster): πr^2
- Mobile source (*e.g.* sparkers): $(\text{distance/day} * 2r) + \pi r^2$

Where distance is the maximum survey trackline per day (177.6 km) and r is the distance to the 160 dB (for impulsive sources) and 120 dB (for non-impulsive sources) isopleths. The isopleths were calculated using practical spreading.

Estimated takes were calculated by multiplying the species density (animals per km²) by the appropriate ZOI, multiplied by the number of appropriate days (*e.g.* 42 for HRG activities or 12 for geotechnical activities) of the specified activity. A detailed description of the acoustic modeling used to calculate zones of influence is provided in Ocean Wind's IHA application (also see the discussion in the *Mitigation Measures* section below).

Ocean Wind used a ZOI of 26.757 km² and a survey period of 42 days, which includes estimated weather downtime, to estimate take from use of the HRG survey equipment during geophysical survey activities. The ZOI is based on the worst case (since it assumes the higher powered GeoSource 800 sparker will be operating all the time) and a maximum survey trackline of 110.4 mi (177.6 km) per day. Based on the planned HRG survey schedule (June 2017), take calculations were based on the summer seasonal species density as derived from Roberts et al. (2016) for cetaceans and seasonal OPAREA density estimates (DoN, 2007) for pinnipeds. The resulting take estimates (rounded to the nearest whole number) are presented in Table 4.

Table 4. Estimated Level B harassment takes for HRG survey activities.

Species	Density for Summer (No./ km ²)	Calculated Take (No.)	Requested Take Authorization (No.)	Percentage of Stock Potentially Affected
Fin Whale	.0008	0.89	5*	0.061
Bottlenose Dolphin	.2534	284.7	285	0.385
Short beaked common Dolphin	.0282	31.69	32	0.047
Harbor Porpoise	.0012	1.34	4*	0.006

*Requested take authorization was increased to account for average group size of fin whales (5) and harbor porpoise (4).

Ocean Wind used a ZOI of 0.31 m² (0.79 km²) and a maximum DP thruster use period of 12 days to estimate take from use of the DP thruster during geotechnical survey activities. The ZOI represents the field-verified distance to the 120 dB isopleth for DP thruster use. Based on the planned geotechnical survey schedule (September 2017), take calculations were based on the fall seasonal species density estimates (Roberts *et al.*, 2016; DoN, 2007) (Table 5). The resulting take estimates (rounded to the nearest whole number) based upon these conservative assumptions for bottlenose dolphins and harbor seals are presented in Table 5. These numbers are based on 12 days and represent only 0.001 percent of the stock for each of these 2 species. Take estimates were increased to take into account average group size where needed (fin whale and harbor porpoise).

Table 5. Estimated Level B harassment takes for geotechnical survey activities.

Species	Density for Fall (No./100 km²)	Calculated Take (No.)	Requested Take Authorization (No.)	Percentage of Stock Potentially Affected
Bottlenose Dolphin	11.44	1.08	1*	0.001
Harbor seal	9.74	0.92	1	0.001

*It is understood that typical pod size for bottlenose dolphins can be 2 to 15 individuals (NOAA 2015b). Given that take for this species has been requested to cover HRG survey activities, in conjunction with mitigation measures, the Applicant has determined that increasing take to account for group size is not necessary.

Ocean Wind's requested take numbers are provided in Tables 4 and 5 and are also the number of takes NMFS is authorizing. Ocean Wind's calculations do not take into account whether a single animal is harassed multiple times or whether each exposure is a different animal. Therefore, the numbers in Tables 4 and 5 are the maximum number of animals that may be harassed during the HRG and geotechnical surveys (*i.e.*, Ocean Wind assumes that each exposure event is a different animal). These estimates do not account for prescribed mitigation measures that Ocean Wind will implement during the specified activities and the fact that shutdown/powerdown procedures shall be implemented if an animal enters within 200 m of the vessel during HRG activities, and 500 m during geotechnical activities, further reducing the potential for any takes to occur during these activities.

Ocean Wind used NMFS' Guidance (NMFS 2016) to determine sound exposure thresholds to determine when an activity that produces sound might result in impacts to a marine mammal such that a take by injury, in the form of PTS, might occur. The functional hearing groups and the associated PTS onset acoustic thresholds are indicated in Table 6 below. Ocean Wind used the user spreadsheet to calculate the isopleth for the loudest source (sparker, sub-bottom profiler). The sub-bottom profiler was calculated with the following conditions: source level at 172.4 rms, vessel velocity of 2.058 m/s, repetition rate of 0.182, pulse duration of 22 ms and a weighting factor adjustment of 10 based on the spectrogram for this equipment (Gardline 2016). Isopleths were less than 3 m for all hearing groups; therefore, no Level A takes were

requested. The Geo-source sparker model used the following parameters: source level at 188.7 rms Source level, vessel velocity of 2.058 meters per second (m/s), repetition rate of 0.25 seconds, pulse duration of 10 ms and weighting factor adjustment of 3 based on the spectrograms for this equipment. Isopleths were less than 2 m for all hearing groups; therefore, no Level A takes were requested. The DP thruster was defined as non-impulsive static continuous source with an extrapolated source level of 150 dB rms based on far field measurements (Subacoustech 2016), an activity duration of 4 hours and weighting factor adjustment of 2. The transmission loss coefficient of 11.1 was used based on the slope of best fit from field measurements (Subacoustech 2016). Isopleths were less than 1 m for all hearing groups; therefore, no Level A take were requested. No level A take is requested or authorized for any of the sources used during HRG and geotechnical surveys.

Table 6. Summary of PTS Onset Acoustic Thresholds.

	PTS Onset Acoustic Thresholds ¹ (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-frequency cetaceans	<i>Cell 1</i> Lpk,flat: 219 dB LE,LF,24h: 183 dB	<i>Cell 2</i> LE,LF,24h: 199 dB
Mid-frequency cetaceans	<i>Cell 3</i> Lpk,flat: 230 dB LE,MF,24h: 185 dB	<i>Cell 4</i> LE,MF,24h: 198 dB
High-frequency cetaceans	<i>Cell 5</i> Lpk,flat: 202 dB LE,HF,24h: 155 dB	<i>Cell 6</i> LE,HF,24h: 173 dB
Phocid Pinnipeds (underwaters)	<i>Cell 7</i> Lpk,flat: 218 dB LE,PW,24h: 185 dB	<i>Cell 8</i> LE,PW,24h: 201 dB
Otariid Pinnipeds (underwater)	<i>Cell 9</i> Lpk,flat: 232 dB LE,OW,24h: 203 dB	<i>Cell 10</i> LE,OW,24h: 219 dB

¹NMFS 2016

Mitigation Measures

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the

least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully balance two primary factors: 1) the manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat, which considers the nature of the potential adverse impact being mitigated (likelihood, scope, range), as well as the likelihood that the measure will be effective if implemented; and the likelihood of effective implementation, and; 2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

With NMFS' input during the application process, and as per the BOEM Lease, Ocean Wind will implement the following mitigation measures during site characterization surveys utilizing HRG survey equipment and use of the DP thruster. The mitigation measures outlined in this section are based on protocols and procedures that have been successfully implemented and

resulted in no observed take of marine mammals for similar offshore projects and previously approved by NMFS (ESS 2013; Dominion 2013 and 2014).

Marine Mammal Exclusion Zones

Protected species observers (PSOs) will monitor the following exclusion/monitoring zones for the presence of marine mammals:

- A 200-m exclusion zone during HRG surveys (this exceeds the estimated Level B harassment isopleth).
- A 500-m monitoring zone during the use of DP thrusters during geotechnical survey activities (this is equal to the Level B harassment isopleth).

The 200 m exclusion zone is the default exclusion zone specified in stipulation 4.4.6.1 of the New Jersey OCS-A 0498 Lease Agreement. The 500 m exclusion zone is based on field-verified distances established during similar survey work conducted within the Bay State Wind Lease Area (Subacoustech 2016).

Visual Monitoring

Visual monitoring of the established exclusion zone(s) for the HRG and geotechnical surveys will be performed by qualified and NMFS-approved PSOs, the resumes of whom will be provided to NMFS for review and approval prior to the start of survey activities. An observer team comprising a minimum of four NMFS-approved PSOs and two certified Passive Acoustic Monitoring (PAM) operators (PAM operators will not function as PSOs), operating in shifts, will be stationed aboard either the survey vessel or a dedicated PSO-vessel. PSOs and PAM operators will work in shifts such that no one monitor will work more than 4 consecutive hours without a 2-hour break or longer than 12 hours during any 24-hour period. During daylight hours the PSOs will rotate in shifts of one on and three off, while during nighttime operations PSOs will work in

pairs. The PAM operators will also be on call as necessary during daytime operations should visual observations become impaired. Each PSO will monitor 360 degrees of the field of vision.

PSOs will be responsible for visually monitoring and identifying marine mammals approaching or within the established exclusion zone(s) during survey activities. It will be the responsibility of the Lead PSO on duty to communicate the presence of marine mammals as well as to communicate and enforce the action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate. PAM operators will communicate detected vocalizations to the Lead PSO on duty, who will then be responsible for implementing the necessary mitigation procedures. A mitigation and monitoring communications flow diagram has been included as Appendix A in the IHA application.

PSOs will be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or exclusion zone using range finders. Reticulated binoculars will also be available to PSOs for use as appropriate based on conditions and visibility to support the siting and monitoring of marine species. Digital single-lens reflex camera equipment will be used to record sightings and verify species identification. During night operations, PAM (see *Passive Acoustic Monitoring* requirements below) and night-vision equipment in combination with infrared technology will be used (Additional details and specifications are provided in Ocean Wind's application in Appendix B for night-vision devices and Appendix C for infrared video monitoring technology). Position data will be recorded using hand-held or vessel global positioning system (GPS) units for each sighting.

The PSOs will begin observation of the exclusion zone(s) at least 60 minutes prior to ramp-up of HRG survey equipment. Use of noise-producing equipment will not begin until the

exclusion zone is clear of all marine mammals for at least 60 minutes, as per the requirements of the BOEM Lease.

If a marine mammal is detected approaching or entering the 200-m exclusion zones during the HRG survey, or the 500-m monitoring zone during DP thrusters use, the vessel operator will adhere to the shutdown (during HRG survey) or powerdown (during DP thruster use) procedures described below to minimize noise impacts on the animals.

At all times, the vessel operator will maintain a separation distance of 500 m from any sighted North Atlantic right whale as stipulated in the *Vessel Strike Avoidance* procedures described below. These stated requirements will be included in the site-specific training to be provided to the survey team.

Vessel Strike Avoidance

The Applicant will ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds and slow down or stop their vessels to avoid striking these species. Survey vessel crew members responsible for navigation duties will receive site-specific training on marine mammal and sea turtle sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures will include the following, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk:

- All vessel operators will comply with 10 knot (<18.5 km per hour [km/h]) speed restrictions in any Dynamic Management Area (DMA). In addition, all vessels operating from November 1 through July 31 will operate at speeds of 10 knots (<18.5 km/h) or less.
- All survey vessels will maintain a separation distance of 500 m or greater from any sighted North Atlantic right whale.

- If underway, vessels must steer a course away from any sighted North Atlantic right whale at 10 knots (<18.5 km/h) or less until the 500 m minimum separation distance has been established. If a North Atlantic right whale is sighted in a vessel's path, or within 100 m to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines will not be engaged until the North Atlantic right whale has moved outside of the vessel's path and beyond 100 m. If stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 100 m.
- All vessels will maintain a separation distance of 100 m or greater from any sighted non-delphinoid (*i.e.*, mysticetes and sperm whales) cetaceans. If sighted, the vessel underway must reduce speed and shift the engine to neutral and must not engage the engines until the non-delphinoid cetacean has moved outside of the vessel's path and beyond 100 m. If a survey vessel is stationary, the vessel will not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m.
- All vessels will maintain a separation distance of 50 m or greater from any sighted delphinoid cetacean. Any vessel underway will remain parallel to a sighted delphinoid cetacean's course whenever possible and avoid excessive speed or abrupt changes in direction. Any vessel underway reduces vessel speed to 10 knots or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or abeam (*i.e.*, moving away and at a right angle to the centerline of the vessel) of the underway vessel.
- All vessels will maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped.

The training program will be provided to NMFS for review and approval prior to the start of surveys. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew members understand and will comply with the necessary requirements throughout the survey event.

Seasonal Operating Requirements

Between watch shifts, members of the monitoring team will consult the NMFS North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations. The planned survey activities however, will occur outside of the SMA located off the coasts of Delaware and New Jersey. The planned survey activities will also occur in June/July and September, which is outside of the seasonal mandatory speed restriction period for this SMA (November 1 through April 30).

Throughout all survey operations, Ocean Wind will monitor the NMFS North Atlantic right whale reporting systems for the establishment of a DMA. If NMFS should establish a DMA in the Lease Area under survey, within 24 hours of the establishment of the DMA Ocean Wind will work with NMFS to shut down and/or alter the survey activities to avoid the DMA.

Passive Acoustic Monitoring

As per the BOEM Lease, alternative monitoring technologies (*e.g.*, active or passive acoustic monitoring) are required if a Lessee intends to conduct geophysical surveys at night or when visual observation is otherwise impaired. To support 24-hour HRG survey operations, Ocean Wind will use certified PAM operators with experience reviewing and identifying recorded marine mammal vocalizations, as part of the project monitoring during nighttime operations to provide for optimal acquisition of species detections at night, or as needed during

periods when visual observations may be impaired. In addition, PAM systems shall be employed during daylight hours to support system calibration and PSO and PAM team coordination, as well as in support of efforts to evaluate the effectiveness of the various mitigation techniques (*i.e.*, visual observations during day and night, compared to the PAM detections/operations).

Given the range of species that could occur in the Lease Area, the PAM system will consist of an array of hydrophones with both broadband (sampling mid-range frequencies of 2 kHz to 200 kHz) and at least one low-frequency hydrophone (sampling range frequencies of 75 Hz to 30 kHz). Monitoring of the PAM system will be conducted from a customized processing station aboard the HRG survey vessel. The on-board processing station provides the interface between the PAM system and the operator. The PAM operator(s) will monitor the hydrophone signals in real time both aurally (using headphones) and visually (via the monitor screen displays). Ocean Wind plans to use PAMGuard software for “target motion analysis” to support localization in relation to the identified exclusion zone. PAMGuard is an open source and versatile software/hardware interface to enable flexibility in the configuration of in-sea equipment (number of hydrophones, sensitivities, spacing, and geometry). PAM operators will immediately communicate detections/vocalizations to the Lead PSO on duty who will ensure the implementation of the appropriate mitigation measure (*e.g.*, shutdown) even if visual observations by PSOs have not been made.

Ramp-Up

As per the BOEM Lease, a ramp-up procedure will be used for HRG survey equipment capable of adjusting energy levels at the start or re-start of HRG survey activities. A ramp-up procedure will be used at the beginning of HRG survey activities in order to provide additional protection to marine mammals near the Lease Area by allowing them to vacate the area prior to

the commencement of survey equipment use. The ramp-up procedure will not be initiated during daytime, night time, or periods of inclement weather if the exclusion zone cannot be adequately monitored by the PSOs using the appropriate visual technology (*e.g.*, reticulated binoculars, night vision equipment) and/or PAM for a 60-minute period. A ramp-up will begin with the power of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. The power will then be gradually turned up and other acoustic sources added such that the source level will increase in steps not exceeding 6 dB per 5-minute period. If marine mammals are detected within the HRG survey exclusion zone prior to or during the ramp-up, activities will be delayed until the animal(s) has moved outside the monitoring zone and no marine mammals are detected for a period of 60 minutes.

The DP vessel thrusters will be engaged to support the safe operation of the vessel and crew while conducting geotechnical survey activities and require use as necessary. Therefore, there is no opportunity to engage in a ramp-up procedure.

Shutdown and Powerdown

HRG Survey - The exclusion zone(s) around the noise-producing activities (HRG survey equipment) will be monitored, as previously described, by PSOs and at night by PAM operators for the presence of marine mammals before, during, and after any noise-producing activity. The vessel operator must comply immediately with any call for shutdown by the Lead PSO. Any disagreement should be discussed only after shutdown.

As per the BOEM Lease, if a non-delphinoid (*i.e.*, mysticetes and sperm whales) cetacean is detected at or within the established exclusion zone (200-m exclusion zone), an immediate shutdown of the HRG survey equipment is required. Subsequent restart of the electromechanical survey equipment must use the ramp-up procedures described above and may only occur

following clearance of the exclusion zone for 60 minutes. These are extremely conservative shutdown zones, as the 200-m exclusion radii exceed the distances to the estimated Level B harassment isopleths (75.28 m).

As per the BOEM Lease, if a delphinoid cetacean or pinniped is detected at or within the exclusion zone, the HRG survey equipment (including the sub-bottom profiler) must be powered down to the lowest power output that is technically feasible. Subsequent power up of the survey equipment must use the ramp-up procedures described above and may occur after (1) the exclusion zone is clear of a delphinoid cetacean and/or pinniped for 60 minutes or (2) a determination by the PSO after a minimum of 10 minutes of observation that the delphinoid cetacean or pinniped is approaching the vessel or towed equipment at a speed and vector that indicates voluntary approach to bow-ride or chase towed equipment.

If the HRG sound source (including the sub-bottom profiler) shuts down for reasons other than encroachment into the exclusion zone by a marine mammal including but not limited to a mechanical or electronic failure, resulting in the cessation of sound source for a period greater than 20 minutes, a restart for the HRG survey equipment (including the sub-bottom profiler) is required using the full ramp-up procedures and clearance of the exclusion zone of all cetaceans and pinnipeds for 60 minutes. If the pause is less than 20 minutes, the equipment may be restarted as soon as practicable at its operational level as long as visual surveys were continued diligently throughout the silent period and the exclusion zone remained clear of cetaceans and pinnipeds. If the visual surveys were not continued diligently during the pause of 20 minutes or less, a restart of the HRG survey equipment (including the sub-bottom profiler) is required using the full ramp-up procedures and clearance of the exclusion zone for all cetaceans and pinnipeds for 60 minutes.

Geotechnical Survey (DP Thrusters) - During geotechnical survey activities, a constant position over the drill or CPT site must be maintained to ensure the integrity of the survey equipment. Any stoppage of DP thruster during the geotechnical activities has the potential to result in significant damage to survey equipment. Therefore, during geotechnical survey activities, if marine mammals enter or approach the established exclusion and monitoring zone, Ocean Wind shall reduce DP thruster to the maximum extent possible, except under circumstances when reducing DP thruster use would compromise safety (both human health and environmental) and/or the integrity of the equipment. Reducing thruster energy will effectively reduce the potential for exposure of marine mammals to sound energy. After decreasing thruster energy, PSOs will continue to monitor marine mammal behavior and determine if the animal(s) is moving towards or away from the established monitoring zone. If the animal(s) continues to move towards the sound source then DP thruster use will remain at the reduced level. Normal use will resume when PSOs report that the marine mammals have moved away from and remained clear of the monitoring zone for a minimum of 60 minutes since the last sighting.

Based on our evaluation of the applicant's planned measures, as well as other measures considered by NMFS, NMFS has determined that the planned mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth, requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for incidental take authorizations (ITAs) must include the suggested means of accomplishing the

necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring measures prescribed by NMFS should contribute to improved understanding of one or more of the following general goals:

- Occurrence of marine mammal species or stocks in the action area (*e.g.*, presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Ocean Wind submitted marine mammal monitoring and reporting measures as part of the IHA application. These measures are described below.

Visual Monitoring - Visual monitoring of the established Level B harassment zones (200-m radius during HRG surveys (note that this is the same as the mitigation exclusion/shutdown zones established for HRG survey sound sources); 500-m radius during DP thruster use (note that this is the same as the mitigation powerdown zone established for DP thruster sound sources)) will be performed by qualified and NMFS-approved PSOs (see discussion of PSO qualifications and requirements in *Marine Mammal Exclusion Zones* above).

The PSOs will begin observation of the monitoring zone during all HRG survey activities and all geotechnical operations where DP thrusters are employed. Observations of the monitoring zone will continue throughout the survey activity and/or while DP thrusters are in use. PSOs will be responsible for visually monitoring and identifying marine mammals approaching or entering the established monitoring zone during survey activities.

Observations will take place from the highest available vantage point on the survey vessel. General 360-degree scanning will occur during the monitoring periods, and target scanning by the PSO will occur when alerted of a marine mammal presence.

Data on all PSO observations will be recorded based on standard PSO collection requirements. This will include dates and locations of construction operations; time of observation, location and weather; details of the sightings (*e.g.*, species, age classification (if known), numbers, behavior); and details of any observed “taking” (behavioral disturbances or injury/mortality). The data sheet will be provided to both NMFS and BOEM for review and approval prior to the start of survey activities. In addition, prior to initiation of survey work, all crew members will undergo environmental training, a component of which will focus on the

procedures for sighting and protection of marine mammals. A briefing will also be conducted between the survey supervisors and crews, the PSOs, and Ocean Wind. The purpose of the briefing will be to establish responsibilities of each party, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures.

Acoustic Field Verification – As per the requirements of the BOEM Lease, field verification of the exclusion/monitoring zones will be conducted to determine whether the zones correspond accurately to the relevant isopleths and are adequate to minimize impacts to marine mammals. The details of the field verification strategy will be provided in a Field Verification Plan no later than 45 days prior to the commencement of field verification activities.

Ocean Wind must conduct field verification of the exclusion zone (the 160 dB isopleth) for HRG survey equipment and the powerdown zone (the 120 dB isopleth) for DP thruster use for all equipment operating below 200 kHz. Ocean Wind must take acoustic measurements at a minimum of two reference locations and in a manner that is sufficient to establish source level (peak at 1 meter) and distance to the 160 dB isopleth (the Level B harassment zones for HRG surveys) and 120 dB isopleth (the Level B harassment zone) for DP thruster use. Sound measurements must be taken at the reference locations at two depths (*i.e.*, a depth at mid-water and a depth at approximately 1 meter (3.28 ft) above the seafloor).

Ocean Wind may use the results from its field-verification efforts to request modification of the exclusion/monitoring zones for the HRG or geotechnical surveys. Any new exclusion/monitoring zone radius proposed by Ocean Wind must be based on the most conservative measurements (*i.e.*, the largest safety zone configuration) of the target Level A or Level B harassment acoustic threshold zones. The modified zone must be used for all subsequent

use of field-verified equipment. Ocean Wind must obtain approval from NMFS and BOEM of any new exclusion/monitoring zone before it may be implemented and the IHA shall be modified accordingly.

Reporting Measures

The Applicant will provide the following reports as necessary during survey activities:

- The Applicant will contact NMFS and BOEM within 24 hours of the commencement of survey activities and again within 24 hours of the completion of the activity.
- As per the BOEM Lease: Any observed significant behavioral reactions (*e.g.*, animals departing the area) or injury or mortality to any marine mammals must be reported to NMFS and BOEM within 24 hours of observation. Dead or injured protected species are reported to the NMFS Greater Atlantic Regional Fisheries Office (GARFO) Stranding Hotline (800-900-3622) within 24 hours of sighting, regardless of whether the injury is caused by a vessel. In addition, if the injury or death was caused by a collision with a project related vessel, Ocean Wind must ensure that NMFS and BOEM are notified of the strike within 24 hours. Additional reporting requirements for injured or dead animals are described below (*Notification of Injured or Dead Marine Mammals*).
- *Notification of Injured or Dead Marine Mammals* - In the unanticipated event that the specified HRG and geotechnical activities lead to an injury of a marine mammal (Level A harassment) or mortality (*e.g.*, ship-strike, gear interaction, and/or entanglement), Ocean Wind will immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources and the NOAA GARFO Stranding Coordinator. The report will include the following information:
 - Time, date, and location (latitude/longitude) of the incident;

- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities will not resume until NMFS is able to review the circumstances of the event. NMFS will work with Ocean Wind to minimize reoccurrence of such an event in the future. Ocean Wind will not resume activities until notified by NMFS.

In the event that Ocean Wind discovers an injured or dead marine mammal and determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition), Ocean Wind will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources and the GARFO Stranding Coordinator. The report will include the same information identified in the paragraph above. Activities will be able to continue while NMFS reviews the circumstances of the incident. NMFS will work with Ocean Wind to determine if modifications in the activities are appropriate.

In the event that Ocean Wind discovers an injured or dead marine mammal and determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Ocean Wind will report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, and the GARFO Regional Stranding Coordinator, within 24 hours of the discovery. Ocean Wind will provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS. Ocean Wind can continue its operations under such a case.

- Within 90 days after completion of the marine site characterization survey activities, a technical report will be provided to NMFS and BOEM that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, estimates the number of marine mammals that may have been taken during survey activities, and provides an interpretation of the results and effectiveness of all monitoring tasks. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS.
- In addition to the Applicant's reporting requirements outlined above, Ocean Wind will provide an assessment report of the effectiveness of the various mitigation techniques, *i.e.* visual observations during day and night, compared to the PAM detections/operations. This will be submitted as a draft to NMFS and BOEM 30 days after the completion of the HRG and geotechnical surveys and as a final version 60 days after completion of the surveys.

Negligible Impact Analysis and Determinations

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival. A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes, alone, is not enough information on which to base an impact determination. In addition to considering the authorized number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration, etc.), as well as effects on habitat, the status of the affected stocks, and the likely effectiveness of the mitigation. Consistent with the 1989 preamble for NMFS’ implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into these analyses via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

As discussed in the *Potential Effects of the Specified Activity on Marine Mammals and their Habitat* section, permanent threshold shift, masking, non-auditory physical effects, and vessel strike are not expected to occur. Further, once an area has been surveyed, it is not likely that it will be surveyed again, thereby reducing the likelihood of repeated impacts within the project area.

Potential impacts to marine mammal habitat were discussed previously in this document (see the *Potential Effects of the Specified Activity on Marine Mammals and their Habitat* section). Marine mammal habitat may be impacted by elevated sound levels and some sediment

disturbance, but these impacts would be temporary. Feeding behavior is not likely to be significantly impacted, as marine mammals appear to be less likely to exhibit behavioral reactions or avoidance responses while engaged in feeding activities (Richardson *et al.*, 1995). Prey species are mobile and are broadly distributed throughout the Lease Area; therefore, marine mammals that may be temporarily displaced during survey activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Because of the temporary nature of the disturbance, the availability of similar habitat and resources in the surrounding area, and the lack of important or unique marine mammal habitat, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations. Furthermore, there are no rookeries or mating grounds known to be biologically important to marine mammals within the planned project area. A biologically important feeding area for North Atlantic right whale encompasses the Lease Area (LaBrecque *et al.*, 2015); however, there is no temporal overlap between the biologically important area (BIA) (effective March-April; November-December) and the planned survey activities (June-July; September). There is one ESA-listed species for which takes are authorized: the fin whale. There are currently insufficient data to determine population trends for fin whale (Waring *et al.*, 2015); however, we are authorizing five takes for this species, therefore, we do not expect population-level impacts. There is no designated critical habitat for any ESA-listed marine mammals within the Lease Area, and none of the stocks for non-listed species taken are considered “depleted” or “strategic” by NMFS under the MMPA.

The planned mitigation measures are expected to reduce the number and/or severity of takes by (1) giving animals the opportunity to move away from the sound source before HRG

survey equipment reaches full energy and (2) reducing the intensity of exposure within a certain distance by reducing the DP thruster power. Additional vessel strike avoidance requirements will further mitigate potential impacts to marine mammals during vessel transit to and within the Study Area.

Ocean Wind did not request, and NMFS is not authorizing, take of marine mammals by injury, serious injury, or mortality. NMFS expects that most takes will be in the form of short-term Level B behavioral harassment in the form of brief startling reaction and/or temporary avoidance of the area or decreased foraging (if such activity were occurring)—reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Southall *et al.*, 2007). This is largely due to the short time scale of the planned activities, the low source levels and intermittent nature of many of the technologies planned to be used, as well as the required mitigation measures.

NMFS concludes that exposures to marine mammal species and stocks due to Ocean Wind's HRG and geotechnical survey activities will result in only short-term (temporary and short in duration) and relatively infrequent effects to individuals exposed and not of the type or severity that will be expected to be additive for the very small portion of the stocks and species likely to be exposed. Given the duration and intensity of the activities (including the mitigation) NMFS does not anticipate the number of takes to impact annual rates of recruitment or survival. Animals may temporarily avoid the immediate area, but are not expected to permanently abandon the area. Major shifts in habitat use, distribution, or foraging success, are not expected.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the

monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, NMFS compares the number of individuals taken to the most appropriate estimation of the relevant species or stock size in our determination of whether an authorization is limited to small numbers of marine mammals.

Table 7. Summary of Potential Marine Mammal Takes and Percentage of Stocks Affected.

Species	Requested Take Authorization (No.)	Stock abundance estimate	Percentage of Stock Potentially Affected
Fin Whale (<i>Balaenoptera physalus</i>)	5*	1,618	0.31
Bottlenose Dolphin (<i>Tursiops truncatus</i>)	286	77,532	0.368
Short beaked common Dolphin (<i>Delphinus delphis</i>)	32	70,184	0.045
Harbor Porpoise (<i>Phocoena phocoena</i>)	4*	79,883	0.005
Harbor Seal (<i>Phoca vitulina</i>)	1	75,834	0.001

*Modeled take of this species was increased to account for average group size.

The authorized takes for the HRG and geotechnical surveys represent 0.31 percent of the WNA stock of fin whale, 0.045 percent of the WNA stock of short-beaked common dolphin, 0.368 percent of the Western north Atlantic, offshore stock of bottlenose dolphin, 0.005 percent of the Gulf of Maine/Bay of Fundy stock of harbor porpoise, and 0.001 percent of the WNA stock of harbor seal (Table 7). These take estimates represent the percentage of each species or stock that could be taken by Level B behavioral harassment and are extremely small numbers (less than 1 percent) relative to the affected species or stock sizes.

Based on the analysis contained herein of the planned activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small

numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks will not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Issuance of an MMPA authorization requires compliance with the ESA. Within the project area, fin, humpback, and North Atlantic right whale are listed as endangered under the ESA. Under section 7 of the ESA, BOEM consulted with NMFS on commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf in Massachusetts, Rhode Island, New York and New Jersey Wind Energy Areas. NOAA's GARFO issued a Biological Opinion concluding that these activities may adversely affect but are not likely to jeopardize the continued existence of fin whale, humpback whale, or North Atlantic right whale. The Biological Opinion can be found online at http://www.nmfs.noaa.gov/pr/permits/incidental/energy_other.htm. NMFS is also consulting internally on the issuance of an IHA under section 101(a)(5)(D) of the MMPA for this activity. Following issuance of the Ocean Wind's IHA, the Biological Opinion may be amended to include an incidental take exemption for these marine mammal species, as appropriate.

National Environmental Policy Act (NEPA)

NMFS prepared an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and signed a Finding of No Significant Impact (FONSI) in

June 2017. The EA and FONSI can be found at

http://www.nmfs.noaa.gov/pr/permits/incidental/energy_other.htm.

Authorization

NMFS has issued an IHA to Ocean Wind for the potential harassment of small numbers of five marine mammal species incidental to the marine site characterization project off the coast of New Jersey in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0498), provided the previously mentioned mitigation, monitoring and reporting.

Dated: June 30, 2017.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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